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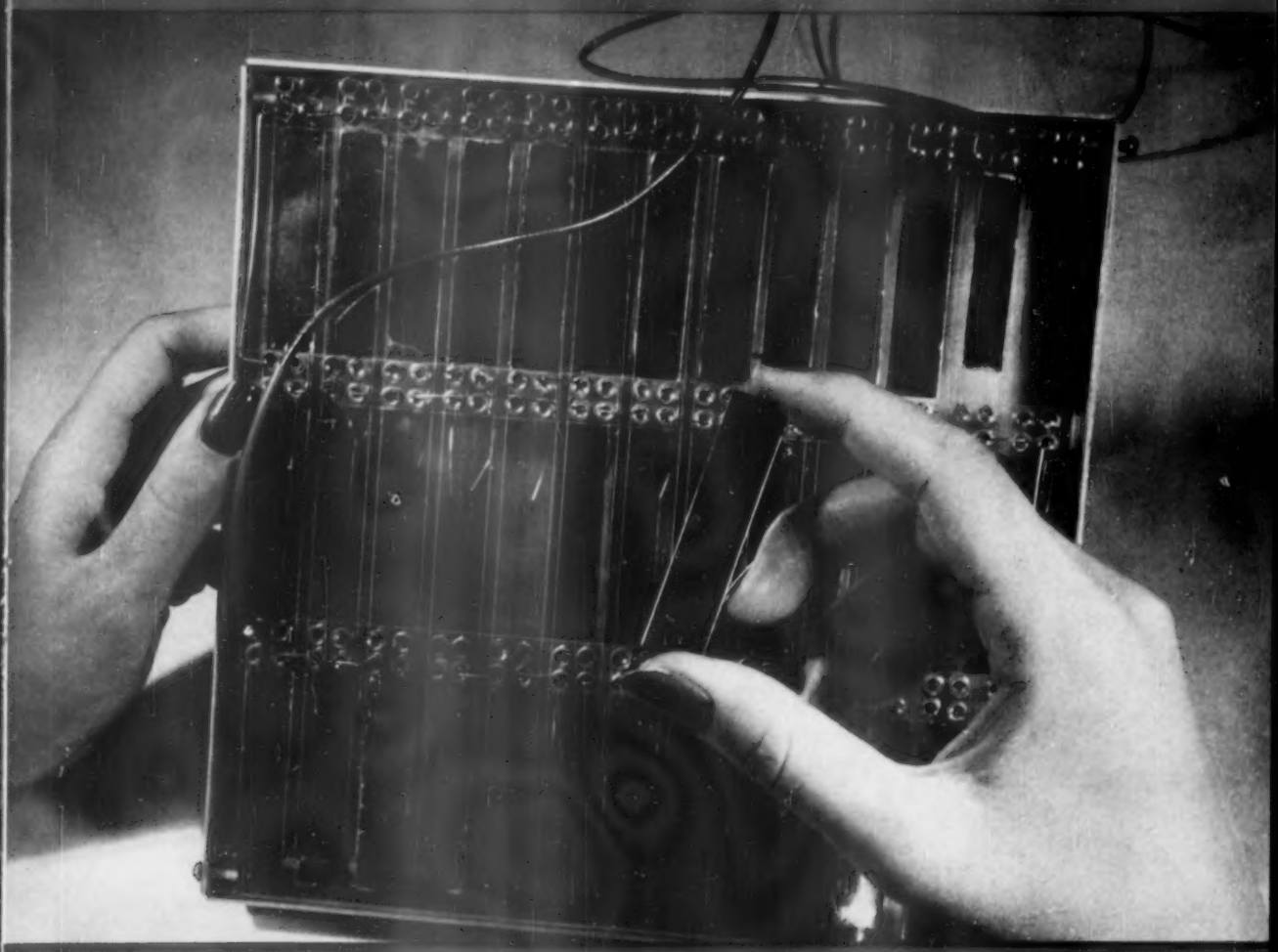
May 1, 1954

VOL. 65, NO. 18 PAGES 273-288

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Solar Battery

See Page 278

A SCIENCE SERVICE PUBLICATION

TELEPHONE SCIENCE GUIDES A PUNCH NO ENEMY CAN DODGE

(Upper left) — Nike's missile climbs to destroy an enemy, under guidance of complex electronic controls. A radar is shown at right. Nike (pronounced Ny'kee) is named after the Greek goddess of Victory.

Is it possible to guide an anti-aircraft missile so that it will track down and destroy a rapidly maneuvering target? No one knew the answer for sure when the U. S. Army put this question to Bell Telephone Laboratories in 1945.

The special skills and techniques developed to create the nation's communications network uniquely fitted Bell scientists to answer this question. They recommended a new system, Nike, and then worked to bring it into being with engineers from Army Ordnance, Western Electric Company and Douglas Aircraft Company.

The first Nike installation has been made, and more will follow. Thus, America's defenses grow stronger through a new extension of frontiers in the communications art. It is a proud achievement of the knowledge and skills first developed at Bell Telephone Laboratories to make the nation's telephone service ever better.

BELL TELEPHONE LABORATORIES

Improving telephone service for America provides careers for creative men in scientific and technical fields

PSYCHOLOGY

Cause of Delinquency

Senate Committee receives opinions from two psychologists that even lurid, sensational comic books are not significant contributing factor to juvenile delinquency.

➤ COMIC BOOKS, even the lurid, sensational "horror" and "terror" comics, are of insignificant importance as a contributor to juvenile delinquency.

This was the reply of Dr. Carl H. Rush Jr., executive assistant of the American Psychological Association, to an inquiry by the Senate Subcommittee to Investigate Juvenile Delinquency. The subcommittee is concerned only with the sensational and violent type of comic book.

There are many factors that might influence juvenile delinquency, such as housing conditions, emotional adjustment, relations with other members of the family. When compared with these influences, the reading of comic books is quite insignificant, Dr. Rush indicated.

Some of the comic books sold to children are gruesome and horrifying, but if they are to be condemned for that it is also necessary to question the suitability of the favorite nursery tales of Anderson, Grimm and even Walt Disney, he pointed out.

The horror comic books do not originate criminal behavior in children, although they may teach techniques of committing crimes or avoiding detection, Dr. Robert H. Felix, director of the National Institute of Mental Health, told the committee.

In a way, the horror comics may do some good, Dr. Felix indicated. Children may use phantasy, as stimulated by the "comics," as a means of working out natural feelings of aggressiveness, but there are other ways of doing this, such as competitive games, and the child should not rely exclusively on the comics.

The disturbed child, he pointed out, may have a greater tendency to read the lurid type of comics, and the wise parent or teacher may be able to tell from the child's choices of comics some of the mental problems the child is facing. If the child wants to read nothing but the crime, horror type of comic, the parent has cause to worry about his mental health. The choice of reading is thus a symptom rather than a cause of the child's problems.

Both Dr. Rush and Dr. Felix stressed that very little research has been done on this subject, so that scientists do not yet know enough about the effect of this kind of reading on either normal or emotionally disturbed children.

Dr. Rush said that research was "sorely needed" to investigate juvenile delinquency as a developmental problem, with studies being followed up over a period of years.

It is imperative, he said, that this research "be placed in a broad context, one in which the influence of comic books is but one aspect of a larger program which has as its objective the determination of the multiple causes of juvenile delinquency."

Science News Letter, May 1, 1954

PALEONTOLOGY

Life on Earth at Least 2,500,000,000 Years Ago

➤ THE CREATION of life upon earth occurred at least 2,500,000,000 years ago, a mere billion years after the solid crust of the earth was formed in the course of the evolution of the planet.

Discovery of carbon of living origin in Canadian slates dating from the early pre-Cambrian geologic era is announced in *Science* (April 16) by Dr. Kalervo Rankama of the University of Helsinki's Institute of Geology.

Clue to the live origin of carbon extracted from the ancient rocks is contained in the ratio of isotopes, carbon-12 and carbon-13, contained in the rocks.

In 1948 Dr. Rankama reported what was then regarded as the most ancient proof of the existence of life upon earth. This was a pre-Cambrian fossil, *Corycium*, with an estimated age of 1,500,000,000 years. The ancient carbon now reported to be 2,550,000,000 years old cannot be assigned to any particular kind of living matter, although the istotope ratio indicates that it is of biogenic origin.

Conditions probably were favorable for the creation of life soon after the making of the solid crust of the earth, which is dated as 3,500,000,000 years ago. Analysis of carbonaceous slates from the Canadian Shield area shows that living organisms were in existence about a billion years later.

Science News Letter, May 1, 1954

CHEMISTRY

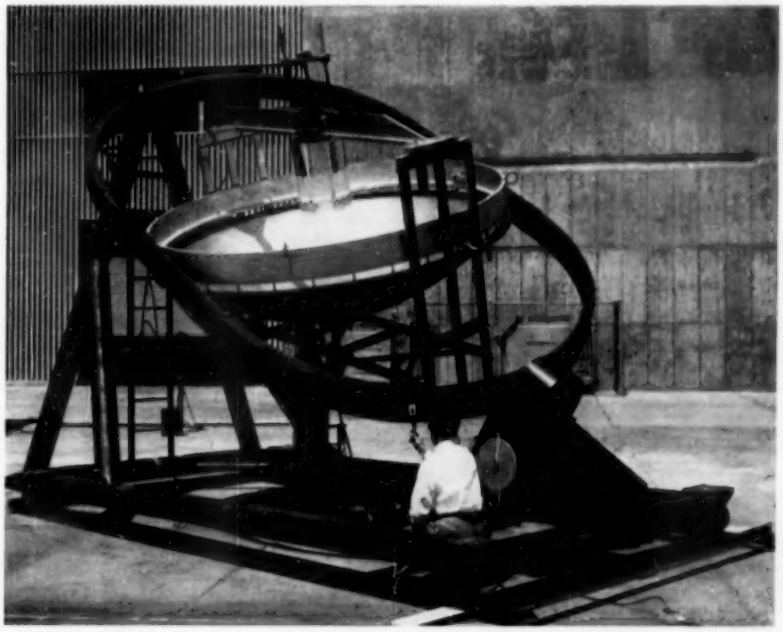
Find Tiny Triangles On Faces of Diamonds

➤ TRIANGULAR FIGURES on the face of diamonds, caused by high temperatures, have been discovered by two scientists at the Diamond Research Laboratory at Johannesburg, South Africa.

The new variation of surface etching, which takes the form of trigons or harp-like shapes, is reported in *Nature* (April 17) by J. F. H. Custers and H. R. Simpson.

Simply air, at a temperature of 1,400 degrees Centigrade, was used in producing the new effect. Apparently the very tiny figures had not been observed before.

Science News Letter, May 1, 1954



***SOLAR FURNACE**—Rays from the sun are collected by an aluminum mirror with a 120-inch diameter and reflected to a focal point five-sixteenths of an inch in diameter in this large Convair solar furnace. With ideal sky conditions, the furnace can develop a temperature of 8500 degrees Fahrenheit.*

SURGERY

Human Gristle for Repairs

► DICED HUMAN gristle can be used to make ears and hip joint discs and to repair spines and hernias.

This use of the material surrounding joints, known technically as cartilage, was reported by Dr. Lyndon A. Peer of Newark, N. J., at the American Association of Plastic Surgeons meeting in Galveston, Texas.

Dr. Peer, chief of the plastic surgery department of St. Barnabas Hospital in Newark, first developed diced cartilage grafts to fill out bony depressions of the skull or chin. Cartilage for these operations, Dr. Peer said, can be taken either from the patient's own ribs or from a cartilage bank, and has proved to be well tolerated by the human body.

Dr. Peer created an ear out of the patient's own tissue and cartilage, by the use of cartilage shavings packed into a perforated vitallium mold. The cartilage, he said, conforms to the shape of the mold "like wet sand in a sand mold."

When the mold is buried beneath the patient's abdominal skin for five months, connective tissue grows through its openings. When the cartilage is removed from the mold, it has become a solid ear structure, ready for attachment to the head. Such ears can be made for a child born without ears.

Working in collaboration with another surgeon, Dr. John Flanagan of Newark, Dr. Peer used a similar principle to construct a cartilaginous disc for a patient with an immobilized hip joint. Eight months after surgery the patient is walking well on the hip.

In spina bifida, a serious congenital deformity characterized by extensive bony defects of the spinal cord, Dr. Peer reported he and Dr. Robert Green of South Orange, N. J., used diced cartilage grafts taken from a cartilage bank to correct the defects.

In cases of recurrent abdominal hernia, diced cartilage has been used by Dr. George Simms of Rutherford, N. J., as a reinforcement for the abdominal wall, where it acts as an internal or buried truss. Although hernia had recurred in one patient following an earlier operation, there has been no recurrence for two years after diced cartilage was added.

Science News Letter, May 1, 1954

GENERAL SCIENCE

Atomic Parley In U. S.?

► HOLDING PRESIDENT Eisenhower's international conference of atomic scientists to discuss the peaceful atom may not be possible within the United States.

Visas will not be obtainable for some of the world's leading atomic scientists unless exceptions are authorized to the usual methods of visa granting by the Department of State. Restrictions set up under congressional laws now result in decisions on visas for foreign scientists taking six to nine months or more.

Diplomatic passports may solve the problem for the foreign conferees, but even such credentials may not prevent some invitees from being confined to narrow geographical limits around the conference site, just as most of the nation is "out-of-bounds" to some United Nations diplomats.

Canada may provide an escape from hampering U. S. laws. The International Congress of Psychology is being held at Montreal in June, although at first scheduled for the United States. The move to Canada was made to avoid embarrassing clashes over U. S. visas.

The atomic scientists might also assemble on a cruise ship, one which did not belong to the U. S., and stay outside our three-mile limit.

The National Academy of Sciences, a quasi-governmental organization that serves as the senate of American science, would be the logical "national scientific organization" to convene the President's conference announced by AEC Chairman Lewis L. Strauss in a Los Angeles speech.

Scientists generally will welcome free discussion of atomic science, bottled up internationally since about 1940. It is not generally realized that scientists themselves without government sanction or urging established a self-imposed censorship upon atomic research reports which was in effect before the war. This security was very effective. Scientists knew what should and should not be told. In fact, atomic security originated with them. The politicians and the military seem to have forgotten this.

If the proposed conference is closed to all Americans but those with "Q" clearance, the meeting will be a travesty. A small step toward recapturing American atomic science prestige internationally would be to invite Dr. J. Robert Oppenheimer to be chairman of the conference.

Science News Letter, May 1, 1954

MEDICINE

Green Mice Aid Cancer Studies

► SOME GREEN mice are helping scientists at Beth Israel Hospital, New York, in their search for possible anti-cancer chemicals.

The mice turned green because they had chlorophyll (more precisely, sodium potassium copper chlorophyllin) injected under their skins. The green stuff spread very rapidly, staining all the tissues covering the bellies of the mice and most of the internal organs. Brain and lungs were not stained green. Six months later the lymph glands, muscles, ribs, skin, livers and kidneys of the mice still were distinctly green.

In mice with cancers, the chlorophyll concentrated in the cancers, turning them green.

The studies were reported by Drs. William Antopol and Susi Glaubach at the meetings of the Federation of American Societies for Experimental Biology in Atlantic City, N. J.

Science News Letter, May 1, 1954

SCIENCE NEWS LETTER

VOL. 65 MAY 1, 1954 NO. 18

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W., Washington 6, D. C., NOrth 7-2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., $5.50; 2 yrs., $10.00; 3 yrs., $14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C., under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 34.40, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 1 E. 54th St., New York 22, ELdorado 5-5666, and 435 N. Michigan Ave., Chicago 11, SUperior 7-6048.

SCIENCE SERVICE

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OCEANOGRAPHY

Heavy Iceberg Year

Icebergs will invade ocean traffic lanes south of Grand Banks in larger numbers than usual, an oceanographer predicts on basis of temperature measurements of Gulf Stream.

➤ THE ICEBERG menace this year will be heavier than usual, Louis A. Post of the U. S. Navy's Hydrographic Office has predicted.

Usually 400 or so of the towering white mountains drift south of Grand Banks to threaten shipping by invading ocean traffic lanes. Mr. Post's prediction of a heavy iceberg year results from temperature-takings in the Gulf Stream.

The warmth of the Gulf Stream off Key West, Fla., he has found, is a key to both the number and the southerly drift of icebergs in two ways. Over a short, three-month period, a warmer-than-usual current will tend to stop the southerly drift of the bergs. Over a longer period, the temperature takings indicate the strength of the Labrador Current as it will sweep the bergs southward three years from then.

Mr. Post said that Gulf Stream readings from three years ago showed that this would be a bad year for icebergs. Since the first of the year, however, the Gulf Stream has been stronger than usual. Thus, the two streams are fighting each other, the Labrador Current to carry bergs far southward, the Gulf Stream to block them.

Since the two forces are opposing each other, it is difficult to forecast just how much worse than usual the icebergs will be this year, Mr. Post pointed out. If the Gulf Stream had been weaker than usual since the first of the year, he said, then we really would be in for a bad year.

Icebergs are Greenland's largest export. They are huge hunks of snow so hard packed that pressure has changed them to ice. They break off from Greenland's west coast glaciers to start a leisurely trip that usually ends off the fog-bound Newfoundland coast.

In this region, known as Grand Banks, the Labrador Current meets the Gulf Stream. There the cold wall, the boundary between the two streams, is nearly straight up and down, sometimes as deep as 1,500 feet.

Sailors have been known to go swimming in the warm Gulf Stream, while within sight of their ship floats an iceberg. This region, where Arctic and tropical waters meet, exhibits the greatest temperature contrasts to be found anywhere in the world.

Icebergs are deceitful in appearance. The amount seen above water is small. About 85% of their bulk lies hidden within the ocean. Jagged edges of ice that jut far beyond the visible white mass are the berg's deadliest weapons.

The sinking of the Titanic by an iceberg on April 14, 1912, gave rise to the International Ice Patrol, which is supported by the main shipping nations of the world. It spots icebergs and tracks the big ones as they wander. Radar and loran, as well as visual patrol by plane or ship, are used. Shipping lanes are shifted southward if bergs menace ocean traffic.

Science News Letter, May 1, 1954

PHYSICS

Test for Ether Drift

➤ A NEW test to check whether or not there is an ether drift will be made soon at the National Physical Laboratory, Middlesex, England, Dr. L. Essen has revealed.

Radio waves instead of light will be used to detect the presence or lack of an all-pervading fluid, called the ether. The proposed experiment could have "an accuracy at least ten times as great" as previous experiments, Dr. Essen said.

In the last century, the ether seemed necessary to explain how light and electromagnetic radiation operated. It was supposed to be in perfect vacuum everywhere, but at each point in empty space it would have a velocity less than that of light. If this were so, there should be an ether drift, that is, a relative motion of matter with respect to the ether through which it moves, just as when walking through still air, you experience a wind.

Michelson and Morley, and later other scientists, failed to detect such an ether drift.

The idea of a universal ether was abandoned after Einstein proposed his theory of relativity, which requires all directions to be equivalent.

The method Dr. Essen proposes to use would send a radio wave down a metal tube, reflecting it backward and forward between the two ends. When the time of travel between the ends equals the time interval between the successive radio waves, they build up to produce an electrical resonance.

The metal tube, known as a cavity resonator, would be used to control the frequency of the oscillator that sends out the radio waves. Anything causing a change in the resonant frequency of the metal tube would change the oscillation frequency by almost exactly the same amount. Thus, when the tube was rotated through a 90-degree angle, the oscillation frequency would change if there were an ether.

"Some physicists," Dr. Essen concludes, "have felt that the Michelson-Morley experiment formed a rather unsatisfactory basis for a theory as important as that of relativity."

Therefore, he proposes in *Nature* (April 17) another try by the radio wave method.

Science News Letter, May 1, 1954

STATISTICS

Having Babies Safer Than Ever in U. S.

➤ IT IS safer than ever for American women to have babies. Even those in their late 30's now can have babies more safely than women in their early 20's about a decade ago.

Instead of dying at the 1940 rate of 34 per 10,000 live births, mothers having babies in 1953 died at the rate of only about six per 10,000 live births.

This improvement, statisticians of the Metropolitan Life Insurance Company say, is due to "the greatly increased proportion of hospital confinements, more women seeking prenatal care early in pregnancy, better obstetrical care, and—of particular import—the advances in medical science, especially as regards the control of infection through chemotherapy and the antibiotics."

Science News Letter, May 1, 1954

NUTRITION

Food Fads Blamed for Half Billion Dollar Waste

➤ WASTE OF at least half a billion dollars in the United States has been blamed on food fads. The charge was made by Dr. Charles Glen King, scientific director of the Nutrition Foundation, at the spring meeting of the foundation's board of trustees in Chicago.

"Food faddists and nutrition quacks are doing great damage to the public by misleading propaganda," Dr. King declared. "Their efforts cause economic loss in wasted expenditures on food fads reaching about half a billion dollars per year. What is more serious is the confusion they cause in preventing the public from learning and having confidence in sound nutrition practices.

"One of our greatest national needs both economically and health-wise is an educational program that will be effective in an economic sense and in the protection of public health.

"We are now in an almost unbelievable position, with a so-called surplus of foods of high nutritive value and a population that is far below the economic and health level they could reach if we had an adequate education program underway," he said.

Science News Letter, May 1, 1954

METEOROLOGY

Tornadoes Occur When Invisible Wave Breaks

➤ TORNADOES USUALLY occur when an invisible, but real wave in the atmosphere breaks, somewhat like a single wave of water toppling over as it hits the shore.

The breaking atmospheric wave, known as a pressure jump, is believed to be the trigger that sets off tornadoes and other severe storms. It does so, however, only if there is moisture in the air. If the air is dry, the pressure jump can occur, but no severe storms will follow, Dr. Morris Tepper, Weather Bureau meteorologist in charge of research in this field, states.

Hopes of more accurate tornado and severe storm warning service lie in pressure studies now being made by the Bureau in the Midwest, where tornadoes often hit this time of year. The research is aimed at learning more about the cause of tornadoes, how to predict their beginning and their paths.

The Weather Bureau is now publishing the results of the first pressure jump survey, made in 1951.

Science News Letter, May 1, 1954

MEDICINE

Quick Economical Detection of Cancer

➤ FURTHER EVIDENCE of the validity of the Penn-Serroflocculation test, a simple blood test to permit quick, economical detection of cancer, has been announced by doctors at the University of California at Los Angeles and the Los Angeles Veterans Administration Center.

The test is named after Dr. Harry Penn, associate clinical professor of radiology at U.C.L.A., who originated it.

Tried on more than 10,000 individuals during six years of research, the test can detect cancer in a majority of cases, help to distinguish between benign and malignant tumors, and indicate the response of cancer to treatment.

A solution of an inexpensive crystalline chemical is added to a blood sample. If the mixture remains murky, the test is considered negative. If small particles form and the solution clears, a positive test is indicated.

Ninety percent of the cancerous individuals tested have shown a positive result. The 10% missed included those in which cancer had not entered vital tissue, but was still in a microscopic stage. A negative result is considered to be a 10,000-to-1 assurance that the subject has no cancer.

Certain conditions such as arthritis and pregnancy give false positives. Further processing of blood samples will tell, in most cases, whether the positive test is the result of cancer or other diseases.

The accuracy of the Penn-Serroflocculation test is considerably higher than X-rays or any other clinical diagnostic approach.

Science News Letter, May 1, 1954

POWER CHECK-UP—Inventors of the Bell solar battery, G. L. Pearson, D. M. Chapin and C. S. Fuller, are shown checking sample devices for the amount of electricity derived from sunlight, here simulated by a lamp. The solar battery uses strips of silicon to convert the sun's energy directly and efficiently into electricity.

PHYSICS

Sun-Powered Battery

Razor-sized silicon wafer that converts light directly into electricity was unveiled at the National Academy of Sciences meeting. Its efficiency is six percent.

See Front Cover

➤ THE SOLAR battery shown to the National Academy of Sciences meeting in Washington is a quite efficient, simple and direct converter of light into electricity. But it offers no threat to conventional or atomic power plants.

This little device is made of the common chemical element, silicon, in unusual metallic form. It is a cousin of the still novel junction transistor made of related germanium metal.

Just as transistors, replacing electron tubes, are miniaturizing hearing aids, radio sets and other electronic devices, the new silicon solar battery gives promise of first going to work electronically in the nation's telephone system.

The batteries will power mobile equipment such as small radio transmitters. Sun-powered battery chargers will be used at amplifier stations along rural telephone systems of newer design.

Scientists are elated that the new semiconductor device has six percent efficiency in converting sunlight directly into electricity. Other photoelectric devices, such as selenium cells, do not rate more than one percent. The six percent figure compares favorably with steam and gasoline engine efficiency.

Advantages of the solar battery include: No cost of fuel, because it uses sunshine which is free. Nothing consumed or destroyed in the energy conversion process. No moving parts. No wearing out or obsolescence. The solar battery theoretically should last indefinitely.

The Bell Telephone Laboratories scientists who are credited with the development are G. L. Pearson, C. S. Fuller and D. M. Chapin. This team is part of a group, led by William Shockley, that has worked on

the physics of semiconductors since World War II.

Impurities are responsible for the success of the silicon solar battery. Very pure metallic silicon is grown into single crystals. Then, one ten-thousandth of an inch under the surface of the wafer of silicon, impurities are diffused. This produces positive and negative layers of controlled thickness, and these p-n junctions are the heart of the solar battery.

How soon the silicon solar battery can take on greater jobs is problematical. But the wafer-thin strips of silicon, about razor blade size, are extremely sensitive to light. They can be linked together electrically and then deliver power from the sun at 50 watts per square yard of surface.

One of these solar batteries is pictured on the cover of this week's SCIENCE NEWS LETTER. The razor-sized silicon wafer is also shown.

Daily the sun supplies over a thousand trillion kilowatt hours of energy, comparable with all the reserves of coal, oil, natural gas and uranium found on earth. The solar battery taps this stupendous energy from the sun.

Scientists have long sought a practical method of directly converting the almost limitless energy of the sun to electricity. Until now, only the thermocouple and the photoelectric cell have been available, and they are limited to handling minute power quantities.

The thermocouple use small temperature differences in two dissimilar metals to produce a tiny electric current.

Science News Letter, May 1, 1954

DENTISTRY

Heredity Affects Caries

Tooth decay is influenced by heredity, a 17-year study with rats has shown. Findings cannot be applied to man, however, without research on humans.

➤ TOOTH DECAY is influenced by heredity, a Michigan State College research team reports from a 17-year study of rats.

"Although we have proven the hereditary influence of tooth decay in rats," explained Dr. Harrison R. Hunt, professor emeritus of the department of zoology, "we cannot apply our findings to man without research on man himself."

Dr. Hunt and Dr. Carl A. Hoppert, professor of chemistry, were joined last September in their long-range study by Dr. Samuel Rosen, research assistant in the department of zoology.

Twenty-five generations of rats have been studied by Profs. Hunt and Hoppert since their project began in 1937, and more than 600 of the animals are being studied for further clues of tooth decay. Dr. Hunt foresees another 20 years of observations.

It all began in 1937, Dr. Hunt explained, when Dr. Morris Steggerda, anthropologist for the Carnegie Institution in Washington, suggested that the inheritance factor in tooth decay be studied. Dr. Steggerda's suggestion resulted from his study of primitive peoples who have less tooth decay than "civilized" man.

The two professors placed 119 rats on a "Hoppert diet," which is nutritious but produces tooth decay in rats. The animals were carefully observed, and separated according to the speed with which they developed cavities.

Careful breeding followed, until decay-resistant and decay-susceptible strains were developed. During this process, a detailed history of every rat was recorded. Approximately 10,000 such histories have accumulated thus far, Dr. Hunt said.

Today, after the years of careful breeding and selectivity, the susceptible strain takes 30 to 60 days to develop tooth decay, while the resistant strain does not develop tooth decay for at least 550 days. The normal life of a rat is 700 days. Factors of sex and age made little difference in the tests, the researchers found.

"There is no doubt of inheritance as a significant factor," Dr. Hunt concludes.

Dr. Rosen, the newest member of the team, is interested in the part bacteria play in tooth decay. His investigations in this direction are to be emphasized next year. Sponsor of the research is the Public Health Service, Department of Health, Education and Welfare.

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SOLAR POWER SOURCE—The sun's rays falling on the solar battery are the only source of power needed to operate a small mobile radio transmitter. Here D. E. Thomas talks to M. B. Prince across the lawn at Bell Telephone Laboratories.

MEDICINE

New Anti-TB Drugs May Help in Resistant Cases

➤ A NEW class of chemical remedies against tuberculosis, some of which may be useful when TB germs grow resistant to the currently used isoniazid, has been developed.

Dr. A. E. Wilder Smith of the Ed. Geistlich Sons, Ltd., Chemical Works at Wolhusen, Switzerland, announces the development in *Science* (April 16).

Trials of some of the chemicals in human patients are now under way.

The chemicals are called oxdiazolones. They are made from isoniazid by treating the latter with phosgene, better known as a war-time poison gas.

Although slightly less active against TB germs than isoniazid in the test tube, one of the oxdiazolones was somewhat more active against TB germs in guinea pigs. In mice, it is about one-tenth as toxic and in rabbits, one-third as toxic as isoniazid.

"Chronic dosing" of guinea pigs with this oxdiazolone in four times the remedial dose for two months resulted in favorable weight gains by the animals and no signs of damage to any organs.

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MEDICINE

Nerve Gas Antidote for Low Temperature Shock

▶ ATROPINE, THE drug that is an antidote to nerve gas, may become standard low temperature protection equipment for sailors, flyers, mountain climbers and explorers.

Many of the sailors and flyers floundering in the icy waters of the North Atlantic during the early days of World War II would have had a better chance for survival if atropine had been part of their survival equipment.

Findings suggesting this were reported by Dr. Edward R. Baylor and associates of the University of Michigan at the meetings of the Federation of American Societies for Experimental Biology in Atlantic City, N. J.

Atropine, they found, prevents the often fatal shock that comes from extreme exposure to cold. The atropine acts by speeding circulation and destroying a chemical known as ACH, short for acetylcholine, which cuts down circulation.

The findings came from studies of the common water flea. When exposed to extreme cold in the dark, these fleas did not die. When the light was turned on, however, the fleas suffered sudden paralytic seizure and died.

The clue to their death was found in their sensitivity to light. This sensitivity caused increased production of ACH which cut down circulation.

While light does not affect man's circulation, extreme cold does. And extreme cold is enough to generate sufficient amounts of ACH to produce shock. For man, as for the flea, atropine is beneficial in this situation.

Science News Letter, May 1, 1954

TECHNOLOGY

Flameproof Cotton Fabric To Help Save Many Lives

▶ AN ESTIMATED 1,250 people die each year in this country when their clothing burns. Several thousand more are injured by burning clothing.

A practical method of flameproofing cotton fabrics to reduce this danger has been found at the Southern Regional Research Laboratory of the U. S. Department of Agriculture in New Orleans.

Dr. John D. Guthrie and Wilson A. Reeves have worked out a way of combining a crystalline compound, tetrakis-(hydroxymethyl)phosphonium chloride, THPC for short, with trimethylolmelamine so that a plastic-like resin is formed inside cotton fibers.

This resin flameproofs the cotton permanently without harming the other qualities of the fabric.

The fabric is padded with the resin-forming solution, and then dried at temperatures around 185 degrees Fahrenheit. The fabric is then cured at a higher temperature, washed and softened. The softening prevents the process from reducing the tear strength of the fabric.

An additional important property of fabrics flameproofed with this method is that they are also glow-proof. The glow that persists after the flame of burning cotton is extinguished often completely consumes the fabric. The afterglow of this flameproofed cotton lasts less than two seconds.

The resin treatment also increases the wrinkle resistance of the fabric and its resistance to rot and mildew.

Science News Letter, May 1, 1954

MEDICINE

Blood Extender Tried As Remedy for Dropsy

▶ DEXTRAN, BEST known as a blood plasma extender or substitute as some call it, has been tried with some success as a remedy for dropsy.

Its use in eight cases, with "outstandingly good results" in three and some improvement in three more, is reported by Drs. Arthur W. Mollison and J. Basil Rennie of Stobhill General Hospital, Glasgow, in the *British Medical Journal* (April 17).

The patients all had had dropsy for a long time, with other signs of kidney disease. One of them had not been helped by a wide variety of other treatments.

In the three who had the best results, from 27 to 40 pounds of body weight was lost within one to two weeks, showing how much of the excess dropsical fluid was got rid of.

The good results were temporary in every case, and there was no sign that it had any effect on the underlying kidney disease. However, the treatment can be repeated if the dropsy returns. The doctors say they found it "consistently effective," and believe it valuable when other measures fail to relieve the dropsy.

Science News Letter, May 1, 1954

BIOLOGY

Sleep Different in Sexes Under Drug Influence

▶ SEX MAKES a difference in the effect of a sleep-inducing anesthetic drug. So does species. Females sleep four or five times as long as males when under the influence of the drug, hexobarbital. Giving the females male sex hormone and the males female hormone reverses this. Then the females sleep like males and the males like females.

These findings, made with rats, were reported by Miss Gertrude P. Quinn, Julius Axelrod and Dr. Bernard B. Brodie of the U. S. National Heart Institute at the meetings of the Federation of American Societies for Experimental Biology in Atlantic City, N. J.

Science News Letter, May 1, 1954

IN SCIEN

VIROLOGY

Some Viruses Can Break Cell Walls They Attack

▶ SOME VIRUSES can break down the cell walls of organisms they attack. Some remain dormant inside their hosts for many generations, but can be activated to destroy their hosts by sun-tanning ultraviolet light. And although viruses are parasites, some of them get only one-third of a vital chemical, phosphorus, from the living things they attack, getting the rest from the medium outside the attacked cells.

These facts are true for some of the viruses that attack bacteria. The bacterial viruses are being studied at the University of Chicago, because they may show more about the life habits and vulnerability of viruses that attack man, such as those causing common colds, influenca and polio.

The latest virus findings from the research were reported by Earl A. Evans Jr., Ray Koppelman, R. P. Mackal, Leonard Barrington and Lloyd Kozloff at the meeting of the Federation of American Societies for Experimental Biology in Atlantic City, N. J.

Science News Letter, May 1, 1954

PALEONTOLOGY

Large Extinct Animal Had Teeth of Huge Rat

▶ CREATURES THE size of large bears with incisor teeth like those of enormous rats were the extinct tillodonts that could be found in the Northern Hemisphere 55,000,000 to 45,000,000 years ago.

Dr. C. Lewis Gazin, curator of vertebrate paleontology at the Smithsonian Institution, has completed a thorough study of the strange mammals.

The tillodonts apparently represent a chance combination of characteristics that failed to meet the test of changing environment. Dr. Gazin found characters suggesting a half dozen types of present-day animals in the fossil bones.

These mammals left no descendants and there are no existing animals remotely like them, Dr. Gazin said. Despite their teeth, tillodonts cannot be classified as big rats and no relationship to carnivores such as bears exists.

After 10,000,000 years of existence, members of the order had become quite specialized. They may not have been able to cope with changes in their environment and so died out, Dr. Gazin said.

A few skulls and partial skeletons of the tillodonts have been found in the Rocky Mountain area, New Jersey, France and China.

Science News Letter, May 1, 1954

CE FIELDS

ENTOMOLOGY

Gypsy Moth Threatens New England Oaks Again

► NEW ENGLAND'S beautiful hardwood trees, stripped of leaves on a record 1,500,000 acres last year by the gypsy moth, are threatened with a possibly heavier attack this summer.

Preliminary surveys indicate this will be "a very bad year," E. D. Burgess, plant pest control branch, U. S. Department of Agriculture, said. Defoliation for several seasons kills trees.

Some experts in New England have predicted that so many of the eggs left by last year's record horde of moths survived the winter the attack this year will be greater than last year. In the past, gypsy moth peaks have run in eight-year cycles.

The caterpillar of the moth eats the leaves of oak and birch trees particularly, but it will devour almost any leaves, including evergreen needles, when hungry.

State authorities are planning extensive control programs to fight the insects when they start hatching out of their eggs around the first of May. Air spraying of DDT is most often used in attacking the pests in large forests. In Massachusetts, which had the heaviest damage last year, plans are being made for extensive spraying.

The Department of Agriculture will aim its control efforts at preventing the spread of the pest from the New England area. All of the New England states and the eastern part of New York are infested with the gypsy moth. The insect was introduced into this country around 1866.

The 1,500,000-acre total devastated in 1953 was more than double the previous high of 600,000 acres in 1937 and 1945.

Science News Letter, May 1, 1954

METEOROLOGY

Will Forecast Weather Routinely by "Brain"

► WEATHER FORECASTS for 48 hours in the future will be made routinely on a giant electronic "brain" in Sweden by this summer, Dr. Carl-Gustaf Rossby, director of the Institute of Meteorology, Stockholm, revealed in Washington.

The machine's computations will be the basis for 48-hour weather predictions during maneuvers of Swedish military forces at that time, he said.

In the U. S., the Weather Bureau, the Air Force and the Navy will start operating an electronic computer for daily predictions on a trial basis on July 1. (See SNL, April 3, p. 222.)

In Stockholm, the meteorologists are using the Swedish computer, BESC, which stands for Binary Electronic Sequence Computer. It makes about 2,700,000 calculations in less than half an hour to yield the figures on which the 24-hour forecast is based.

Numerical weather forecasting, as the use of giant "brains" in weather predictions is termed, works like this on BESC:

Information on current weather conditions is fed into the computer. Using prescribed formulas, the "brain" computes the winds for one level in the atmosphere one hour in the "future." Then, working in one-hour jumps, these forecasts are repeated until, finally, a picture is obtained of the winds 24 or 48 hours from the time the original data were inserted.

Gathering, plotting, analyzing and feeding the necessary information for a 24-hour forecast into the machine takes about ten and a half hours, Dr. Rossby estimates, although the machine does its computations in about half an hour.

Eventually, he foresees, five-day and even longer forecasts will be made with the aid of a computer.

Science News Letter, May 1, 1954

FORESTRY

Pines That Face Storms Without Help Are Bigger

► PINE TREES that face winds and storms standing free on their own trunks grow bigger and stronger than trees protected with wire supports.

A 15-year experiment conducted in Australia by Dr. M. R. Jacobs, Forestry and Timber Bureau, Canberra, has shown that the radiata pine, *Pinus radiata,* left free to sway in the wind develops a stronger and bigger trunk than protected pines.

After two years of support, the protected trees were no longer stable. The trees collapsed when their guy-wires broke in storms. None of the free-standing trees were felled by winds.

The greatest difference in diameter was at the base of the trunk, Dr. Jacobs reports in the *Australian Journal of Botany* (Feb.). After 10 years, the increased growth due to sway in the free-standing trees could be measured up to 25 and 30 feet on the trunk.

The protected trees grew faster in height during the first two years than the swaying trees, but afterward differences in upward growth were not significant, Dr. Jacobs found.

There was, however, a difference in the relationship of height to diameter between the two series of trees. For trees of the same diameter at a point about four feet above the ground, the protected trees were six to seven feet taller than the trees that were not protected.

The effect of wind sway on the tested trees was greater in a plot cleared of all other trees than in a relatively well stocked test area. Dr. Jacobs believes there may be a connection between the growth response of the individual tree to swaying and the appearance of single trees that dominate an area.

Science News Letter, May 1, 1954

BOTANY

New Plant Genus Has Green and Purple Flower

► ANNOUNCEMENT OF the discovery and christening of a new plant genus, bearing a bright green flower with purple splotches, which grows in remote mountains of northeastern Mexico, has been made.

The plant was identified as a new genus by Dr. Lincoln Constance of the University of California's Berkeley campus and Dr. C. Leo Hitchcock of the University of Washington. It was named *Mathiasella bupleuroides* after Dr. Mildred Mathias of the University of California at Los Angeles.

Dr. Constance and Dr. Mathias are two of the outstanding authorities on the family of plants to which the new flower belongs. This family, the *Umbelliferae,* numbers such plants as carrots and parsley.

The plant was named for Dr. Mathias because of her 25 years of contributions to plant classification and because "her personal qualities have been an important influence in promoting good will among botanists all over the United States."

Science News Letter, May 1, 1954

AGRICULTURE

"Shots" May Increase Cocoa Bean Yields

► CHEAPER COCOA may come from insecticide "shots" injected directly into cocoa trees in the Gold Coast, a British African colony that ordinarily supplies 40% of the world's cocoa.

The swollen shoot virus disease of cocoa trees, carried by the common mealybug, has cut cocoa bean production by as much as three-fourths in some Gold Coast areas.

The resulting world shortage has forced the price of cocoa beans to an all-time high. Candy eaters have observed this in the form of shrinking chocolate bars.

One of the principal methods of fighting the disease has been control of the mealybug. A. D. Hanna of Pest Control, Ltd., and J. Nicol of the West African Cacao Research Institute, both in Tafo, Gold Coast, devised an insecticide injection method to eliminate the necessity for constant spraying to kill the bugs.

Numerous holes three and a half inches deep are drilled into the trunks of the trees. These are filled with the modern insecticide, dimefox, and capped. The chemical enters the circulatory system of the tree, destroying the insects whenever they suck on a leaf. An injection lasts about eight weeks.

The strongest injection reduced the number of mealybugs to one per tree, while untreated trees averaged 3,770 bugs, the scientists report in *Nature* (April 17).

Further experiments are in progress to see if repeated application of the chemical has any harmful effect on the growth and yield of the trees.

Science News Letter, May 1, 1954

GENERAL SCIENCE

Science, Youth and Tomorrow

The National Science Fair, still growing rapidly, is aimed at doing something about America's shortage of scientifically trained men and women.

By ALLEN LONG

➤ SEVERAL MILES from shore a gentle breeze stirred a ripple in the ocean. The ripple began moving toward the coast with the wind urging it on.

At length the ripple grew into a ground swell, and then into a wave. It finally washed ashore, hissing with its frothy white-cap. It was alive in its demeanor, spectacular in its beauty and awesome in its power.

The ripple that grew into a wave can be compared to the National Science Fair, which had its modest beginning in 1950.

Aimed at doing something about the critical shortage of technically trained men and women, the fair now offers reassurance that America's future scientific gauntlet will continue to be grasped by capable hands.

The first fair was held in Philadelphia. It attracted 30 teen-aged scientists from high schools in 13 areas of the United States.

In the following years, as it swept through St. Louis and Washington, D. C., the National Science Fair grew into a ground swell. Last year, the fair rolled into Oak Ridge with a crest of 70 sparkling-eyed teen-agers representing areas from California to Rhode Island.

This year an anticipated 100 youthful scientists will gather at Lafayette, Ind., to display their scientific exhibits on the Purdue University campus.

Like the wave, the National Science Fair is alive in its demeanor. It was established to stir up youth's interest in science in public, private and parochial schools.

Classroom Contacts Inspire

It had long been suspected that many boys and girls became interested in science through their contacts with it in the classroom. Subsequent studies have verified this. A questionnaire sent to past National Science Fair finalists revealed that 40% of them received their scientific inspiration this way.

Linked to school activities, the fair is beginning to make a visible impact upon America's youth. A 17-year-old Warwick, R. I., high school senior had this to say:

"If it hadn't been for the fair, I don't know that I would have become interested in science. But I saw a lot of my classmates preparing their scientific exhibits for our local fair, so I decided to make one too. The more I worked on it the more I got interested in science. Now I've about decided to be an engineer."

And like the wave, the National Science Fair is spectacular in its beauty. Distinguished chemists and physicists alike marveled at the scientific know-how exhibited by teen-agers at Oak Ridge.

Rows upon rows of tables were jammed with test tubes, motors and fossils that reflected maturing, inquiring minds at work. Experiments had been run, specimens had been gathered and analyses had been made by these youngsters. The final results were displayed in a brilliant panorama of science, invigorated with the spirit of youth.

While listening to a young man or woman explaining the whys and wherefores of his or her exhibit, it was not hard to catch a glimpse of the future. It was comforting to imagine John Jones designing a better rocket engine, or Mary Smith working on new vaccines.

Like the wave, the science fair program is becoming awesome in its power. It influence is being felt by hundreds of thousands of children from kindergarten through senior high school. It is attracting like numbers of adults who turn out to see their local fairs.

It is drawing its support from school teachers, civic-minded newspapers, universities, chambers of commerce, scientific societies, technical groups, medical associations and even banks. Large organizations that have been caught up in the fair program have volunteered continued backing.

The National Science Fair is operated by Science Clubs of America, administered by SCIENCE SERVICE. Its scope has steadily spread westward. This year it bites into southern British Columbia in Canada.

Four Top Awards

Originally each local fair could send four finalists to the national event. Last year, however, it was decided that the fair was growing at such a rate that four finalists from each area would be too many in 1954. The number of finalists that each local fair can send was cut to two. Even so, about 30 more finalists are expected this year than entered last year's national fair.

Four top awards are given to two boys and two girls having the best exhibits in the physical and biological sciences.

These awards are unusual. Each finalist is asked to make a "wish list," naming the

IRON AND STEEL—This exhibit showing the physical layout of a plant for reducing and refining iron and steel won a second-place award for Albert C. Petersen Jr. at the National Science Fair at Oak Ridge, Tenn., last year. The 18-year-old youth from Farmington, Conn., now is a freshman in engineering at the University of Connecticut.

scientific equipment he would like to have if he wins. Then if the finalist later is chosen as a first-place winner, he gets his "wished-for" equipment. It amounts to a total value of $125.

Second- and third-place winners, distributed between the sexes in proportion to the number of boys and girls entering each category, amount to $75 and $50 each in scientific "wish" equipment and literature.

Base Exhibit on Project

Getting into the competition is not hard. A student decides upon some project and builds an exhibit around it.

The project can be something especially thought up for the fair. Frequently, however, the projects are the outgrowths of scientific hobbies the students have been pursuing in their spare time.

As many as two winners of each local fair can be declared finalists to the national fair. They are sent to the national event on all-expenses-paid trips by their sponsors, most of which are newspapers.

They again display their exhibits at the national fair. Competent scientists judge the myriad exhibits for national recognition.

Presents Many Opportunities

The boys and girls themselves, however, seem to look upon national honor as a minor achievement. Most seem to feel that just getting to the national fair is the most important thing. During the fair program, the finalists have the opportunity of talking with outstanding scientists. They also tour scientific laboratories and industries. This helps each finalist expand his knowledge of science and to see how science fits into the picture of everyday living in America.

Questionnaire responses from past National Science Fair finalists also showed the teen-agers enjoyed and benefited from meeting each other. The National Science Fair provided the opportunity, for instance, for West Coast students to compare the quality of their work with that of East Coast students.

Presumably, the finalists return to their home towns with helpful hints to pass on to their classmates—hints that could help them win honors for themselves the following year.

Science News Letter, May 1, 1954

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GERONTOLOGY

Cortisone for "Stroke"

▶ PATIENTS STRICKEN by apoplexy, their relatives and doctors need no longer have a defeated feeling or, at best, one of waiting to see whether or not the patient will recover.

A discovery announced in the *Journal of the American Geriatrics Society* (April) seems likely to change that situation dramatically.

Cortisone, hormone chemical famous for its relief of pain-racked arthritics, may in future rescue many "stroke" victims from a helpless, vegetable-like existence.

"Striking" effects of cortisone treatment of nine out of 12 stroke victims have been obtained by Drs. Henry I. Russek, Burton L. Zohman and Allen S. Russek of the Department of Health, Education and Welfare's Public Health Service stationed at Staten Island, N. Y.

A rapid and nearly complete recovery may occur after a stroke with only good nursing care, the doctors point out. But their impression from their use of cortisone is that this hormone chemical "accomplished in one day what ordinarily might take several weeks under conservative treatment."

The patients who responded to cortisone were those whose strokes came from clots. Those who had hemorrhages on the brain were not helped. The treatment was given 15 consecutive patients, but three were dying when treatment was started and cortisone did not save them. These were the three with hemorrhages.

The cortisone was given either by mouth or by hypodermic injection starting on the first day of the stroke. It was continued for three weeks. In the patients helped by it, "dramatic" improvement came within the first 24 hours. Paralytic signs and symptoms began to lessen and difficulty in talking cleared rapidly.

The greatest effects were seen in those patients who were continually drowsing, in a stupor, mentally depressed or apathetic. In patients so afflicted, these symptoms were replaced overnight by a keen alertness and interest in their progress toward recovery. As a result of this and an improved sense of well being, active rehabilitation to overcome the disabling effects of the paralysis could be started after the first or second day.

Four patients were able to walk alone or with a cane after three days of treatment, four more walking at the end of a week, and two after 10 days. Two more were kept in bed because of heart trouble, but these were so improved that they could otherwise have been walking after a short time.

Supporting the view that the cortisone helped the rapid recoveries of the patients was the experience with two patients who had the drug stopped before the full course of treatment. Paralysis increased in these after the treatment was stopped, and lessened when cortisone was started again.

The more seriously ill patients were the ones in whom cortisone seemed to have the greatest effect. The doctors believe the drug acts by reducing the watery swelling in the brain after the stroke.

Science News Letter, May 1, 1954

MAMMALOGY

Philippine Lizard Glides on Skin Wings

▶ THE PHILIPPINE flying lizard glides through the air with the greatest of ease using two folding skin flaps for wings.

Dr. Austin L. Rand, curator of birds at the Chicago Natural History Museum, has observed the lizard "flying" more than 15 feet between trees. In a typical flight, the lizard will lose only about five feet of altitude.

At the top of a tree, the lizard makes a flat jump of three or four feet, then spreads its skin flaps and glides the rest of the way. It is a slender animal about three or four inches long.

Science News Letter, May 1, 1954

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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

AMERICAN SEASHELLS—R. Tucker Abbott—*Van Nostrand*, 541 p., illus., $12.50. This beautifully illustrated book about our seashore treasures was written not only for the student of marine biology, but also for the private collector of seashells who wishes to identify his find and learn about the animals that inhabited the shells.

AN ANALYSIS OF THE KINSEY REPORTS ON SEXUAL BEHAVIOR IN THE HUMAN MALE AND FEMALE—Donald Porter Geddes, Ed.—*New American Library*, 319 p., paper, 50 cents. Educators, sociologists and other specialists tell their impressions of the two Kinsey reports.

THE BROWN BOVERI BETATRON—R. Wideroe and others—*Brown, Boveri Corp.*, 71 p., illus., paper, free upon request to publisher, 19 Rector St., New York, N. Y. A summary of the experience obtained at the Radiotherapeutical Clinic in Zurich since the installation of the betatron, which is principally employed for therapeutical purposes.

COHORT FERTILITY: Native White Women in the United States—Pascal K. Whelpton—*Princeton University Press*, 492 p., $6.00. A study of the fertility of actual groups of native white women year by year, as they live through the child-bearing period. It shows the way parents plan their families and space births so that they will occur in years they consider favorable.

DECORATING ON A BUDGET—Elizabeth Ogg—*Barrows*, 246 p., illus., $4.50. A practical guide to help you spend your money wisely when redecorating or furnishing your new home.

DYNAMICS OF GROWTH PROCESSES—Edgar J. Boell, Ed.—*Princeton University Press*, 304 p., illus., $7.50. Papers presented at the Eleventh Growth Symposium, ranging in scope from the analysis of virus reproduction to the mathematics of human population growth.

FARMING WITH NATURE—Joseph A. Cocannouer—*University of Oklahoma Press*, 147 p., $2.95. Good farming, according to the author, consists largely of maintaining an unbroken, dynamic fertility chain in the land. This book explains nature's fertility links. A diversification of crops has much to do with keeping the land productive.

FUNDAMENTALS OF INORGANIC, ORGANIC AND BIOLOGICAL CHEMISTRY — Joseph I. Routh — *Saunders*, 3d ed., 418 p., illus., $4.00. This textbook has been brought up to date, and due to the increasing importance of atomic energy in the world, the sections on radioactive isotopes and atomic energy have been expanded and rewritten.

GENERAL CHEMISTRY: A Topical Introduction.—Eugene G. Rochow and M. Kent Wilson—*Wiley*, 602 p., illus., $6.00. A textbook for the serious student, this presentation of chemical principles is not "watered down" but it is simplified.

GRAPHIC SURVEY OF SCIENCE—William Lemkin—*Oxford Book*, 378 p., illus., cloth $2.20, paper $1.20. A concise text for ninth grade.

HISTORY OF AMERICAN INDUSTRIAL SCIENCE—Courtney Robert Hall—*Library Publishers*, 453 p., $4.95. In this country has been developed the most extensive and intricate industrial organization that the world has ever known; the author feels that this has contributed more than anything else toward making the United States a strong nation.

LABORATORY MANUAL OF CHEMISTRY—Joseph I. Routh—*Saunders*, 3d ed., 109 p., illus., paper, $1.75. A new section of experiments on radioactivity has been included in this edition.

LIVING CRAFTS—G. Bernard Hughes—*Philosophical Library*, 192 p., illus., $4.75. Describing the history and present techniques of a variety of crafts being practiced today.

THE MATING INSTINCT—Lorus J. and Margery J. Milne—*Little, Brown*, 243 p., illus., $4.50. Sexual behavior of animals is presented here from the natural scientist's point of view. Mankind, the authors state, has no monopoly on sex.

OF WHALES AND MEN—R. B. Robertson—*Knopf*, 300 p., illus., $4.50. Modern whaling as seen through the eyes of the senior medical officer to one of the largest Antarctic whaling expeditions of the 1950 season.

PHYSICAL GEOLOGY—L. Don Leet and Sheldon Judson—*Prentice-Hall*, 466 p., illus., $9.00. This book is addressed to those who have had no previous training in science at the college level and are new to this subject. Physical geology deals with the nature and properties of the materials of the earth, their distribution, and what happens to them.

PHYSICS: A Basic Science—Elmer E. Burns and others—*Van Nostrand*, 3d ed., 546 p., illus., $4.12. New developments in the constantly changing field of physics have been included in this revised high school textbook.

POPULATION GROWTH IN STANDARD METROPOLITAN AREAS 1900-1950: With an Explanatory Analysis of Urbanized Areas—Donald J. Bogue—*Govt. Printing Office*, 76 p., paper, 55 cents. (See page 285.)

RELAXATION METHODS—D. N. de G. Allen—*McGraw-Hill*, 257 p., illus., $7.50. Designed to teach the engineering student how to use the relaxation method to solve mathematical problems which arise in engineering science and applied physics.

SHORT CUT TO PHOTOGRAPHY — Godfrey Frankel—*Sterling*, 128 p., illus., $2.50. This book, written for teen-agers or beginners, is in simple, non-technical language.

STREPTOCOCCAL INFECTIONS — Maclyn McCarty, Ed.—*Columbia University Press*, 218 p., illus., $5.00. Containing papers presented at the New York Academy of Medicine Symposium, February 25 and 26, 1953, reviewing aspects of the biology of streptococci and their relationship to diseases of man.

THROUGH THE MAGNIFYING GLASS: Little Things That Make a Big Difference—Julius Schwartz—*Whittlesey House*, 142 p., illus., $2.50. Telling children about the fascinating world that can be discovered by looking through a magnifying glass.

WINE AS FOOD AND MEDICINE—Salvatore P. Lucia—*Blakiston*, 149 p., $3.99.

Science News Letter, May 1, 1954

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ENGINEERING

Car Color Can Mean Life or Death for You

► THE COLOR you pick for your new car or for a new paint job may make the difference between life and death.

This is indicated in a study of the relationship of color to depth perception by investigators at the University of California at Los Angeles Institute of Transportation and Traffic Engineering. They are George Mount, Harry Case, Wesley Sanders and Robert Brenner.

The study revealed that the contrast of a color with its background definitely influenced a person's judgment of the distance of an object. Certain colors made objects appear closer than other colors.

A group of 164 individuals viewed colored cards through a small aperture at a distance of approximately 200 feet. Cards which were either much darker or much lighter than the background appeared to be closer than cards whose brightness was more nearly that of their background. Blue and yellow cards appeared to be as much as six feet closer than cards of other colors at the same distance.

"A distance of six feet in distance judgment may be the difference between having a serious accident or not having one," the investigators point out.

A two-toned car of blue and yellow would seem to be one of the safest car color combinations. The darker blue is seen more easily in daylight and fog, while the lighter yellow is more easily seen at night.

Science News Letter, May 1, 1954

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GENERAL SCIENCE

U. S. Sticks to Cities

► THE THREAT of the atomic bomb is not scaring the American people away from the large cities.

This was found in a study of population growth of cities in the present century made by Dr. Donald J. Bogue, associate director of the Scripps Foundation for Research in Population Problems, Oxford, Ohio, for the U. S. Housing and Home Finance Agency. (See p. 284.)

"During the decade just finished, which ushered in the atom bomb, there is no evidence of a suspension of growth in the large centers and a major transferal of growth to the smaller ones," Dr. Bogue declared in his report.

It is true that a total of 22 new metropolitan areas were created during the decade, but this is not exceptional in the atomic decade, Dr. Bogue points out. In 1920, 23 new areas of this type were reported, and the number in 1930 was 21.

There was also a stepping up of the movement from the centers out into the suburbs, but this was only an acceleration and extension of a trend already established in the 1930's. In Dr. Bogue's opinion, it would be difficult to attribute it to a desire to live at a greater distance from "ground zero."

More important, but having nothing to do with the atomic bomb, is the shift in regional development of cities. The growth of cities in the Northeast dropped way below average for the country as a whole, to 10.2% as compared to the nation's 21.8%.

The South is now having a very rapid metropolitan development. In the 1940-50 decade, the South increased its city population more than 50% faster than the average rate in the nation.

"These," Dr. Bogue comments, "are the fastest rates of metropolitan growth which the South has enjoyed since 1900 or possibly much earlier. They are faster rates of growth than those which prevailed in the Northeast and the North Center region during their period of rapid metropolitan expansion."

Growth rates of southern cities are second only to those of the West, which has broken all records. The movement to the West, Dr. Bogue found, has been predominantly a movement to western cities and not to the wide open spaces.

Fastest growing city in the decade is Albuquerque, N. Mex., with a 109.9% increase in population. Following next are Lubbock, Texas, and San Diego, Calif.

Science News Letter, May 1, 1954

MILITARY STRATEGY

Improve Bayonet Tactics

► BAYONET FIGHTING, which is almost the same today as it was in 1905, may be revised to give young Marines a better chance in hand-to-hand combat.

New tactics have been worked out by Dr. Armond H. Seidler, formerly an Army bayonet instructor in World War II, who is now a physical education teacher at the University of Illinois. Both the Marine Corps and the Army currently are studying the merits of his system.

Dr. Seidler says his tactics provide the Marine with better guard and with less time out of the guard position. It yields a faster striking speed with quicker recovery. It adds up to 10 inches to the range of the Marine with his weapon, keeps him in better balance and requires less energy.

In the Army system, guard position is with the rifle outthrust. In the new system, guard position is with the rifle diagonally across the body—a sort of high "port arms." This makes it easy for the Marine to parry an opponent's thrust and knock the attacking weapon aside.

Dr. Seidler and Maj. George Golleher of Quantico, Va., state in the *Marine Corps Gazette* (April) that studies show the new method can save great amounts of the Marine's energy. During two-minute runs, the method required an average of 54,261 fewer foot pounds of work than the regulation method. This amounts to a saving of more than four-fifths of a horsepower in that time.

"Imagine what this means," the article added. "An assault on the enemy position is conducted from 100 yards, up a steep grade and using assault fire. When the enemy position is reached, it may be necessary for many reasons to use the bayonet. The assaulter is physically weary; the rifle and bayonet are heavy and the assaulter is puffing and panting from his exertions. Which system of bayonet fighting would be to his benefit?"

Science News Letter, May 1, 1954

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MEDICINE

Larynx Cancer Patients Helped by Betatron

► "ENCOURAGING" RESULTS in treatment of larynx cancers with a dual beam, 31,000,000-electron-volt betatron are reported by Dr. Th. Meister of Zurich University Radiological Institute and the Cantonal Hospital, Zurich, Switzerland.

The patients he treated had cancers of the larynx, or voice box, and adjacent parts of the throat. All have been free of symptoms for 18 to 20 months and present a good cosmetic effect. The skin of the neck showed practically no reaction after the treatment.

The betatron, Dr. Meister predicts, "should open up new possibilities" for treatment of cancers inside the mouth, because of the low degree at which its rays are absorbed by bones.

Results of betatron treatment of cancers of the lungs and esophagus were disappointing. Results in cases of bladder tumors were more favorable.

In cancers of the stomach and rectum, Dr. Meister reports the betatron gave palliative results, that is, relief of symptoms, that could not be achieved with 200-kilovolt X-rays.

The betatron was made by Brown, Boveri and Co., Ltd., of Baden, Switzerland. It has been in regular use in Dr. Meister's clinic for treatment of deep seated tumors since April, 1951. During the first two years, over 200 patients were treated. Many of these were far advanced cases of cancer. Both the number treated and the time since treatment are too little to warrant exact analysis and evaluation of the success of the betatron, Dr. Meister states.

Science News Letter, May 1, 1954

MATH IS FUN
By Joseph Degrazia, Ph.D.

Here is a treasury of brain-teasers. You need not be a mathematical genius to solve these problems and puzzles. What you need is to know how to THINK LOGICALLY—how to REASON. This is practically a "course" in applied logic and reasoning—besides being an immense amount of fun that will keep you absorbed for many hours. You will find not only that MATH IS FUN, but also that learning math can be fun!

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MEDICINE

Hope for Hormone To Control Anemia

➤ FURTHER HOPE that a hormone has been found that may aid in the eventual control of anemia is contained in a research report presented by two University of California scientists at the meeting of the Federation of American Societies for Experimental Biology in Atlantic City, N. J.

Drs. Alexander N. Contoupoulos and John H. Lawrence said that a new pituitary hormone has been found effective in controlling anemia in newborn rats.

The scientists and their colleagues reported the discovery of the pituitary factor, distinct from all other pituitary hormones, a year ago. (See SNL, May 2, 1953, p. 281.) They said then the factor promoted red blood cell production in the bone marrow of animals. They call the factor erythropoietic (red blood cell stimulating) hormone.

The new experiments are based on the well known fact that new-born rats develop anemia that increases in severity until the 18th day of life, when red cell count begins to pick up, reaching normal at 35 days.

Different groups of newborn rats were treated with a variety of possibly effective agents from the 4th to the 18th day of life. The agents included testosterone, thyroxin, ACTH, iron gluconate and the erythropoietic factor.

Only the erythropoietic factor prevented anemia. Animals treated with this factor had normal adult red cell levels at the 18th day of life, when the other animals suffered their severest anemia.

The results further support the existence of a red cell generating hormone of the pituitary. Research to purify and understand the hormone, which it is hoped may eventually be useful in controlling anemia, is continuing.

The hormone is not yet available for any but animal experiments. Not enough is known about it for use in humans, nor can it be obtained in sufficient quantities for this purpose at present.

The research is part of a collaborative study between the Institute of Experimental Biology and the Donner Laboratory on the Berkeley campus.

Science News Letter, May 1, 1954

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BOTANY

NATURE RAMBLINGS

Iris

➤ BOTH THOSE who like to walk out to meet the Spring and those who are content to watch it blossom forth in the windows of the local florist keep an eye peeled for members of the iris family.

It is unlikely that either will be disappointed for it is a numerous and popular clan. There are about 800 species in the iris family, known technically as the *iridaceae*. One genus within the family is the iris itself. Other important genera are the crocus and the gladiolus.

Irises come in bright, assertive colors which is probably why the name "iris," Greek for rainbow, was applied to them. Irises are widely distributed throughout the north temperate zone. Many species have been imported and they have been extensively hybridized to develop favored horticultural types. The best known native iris is the blue flag which is generally found growing in moist or marshy terrain.

The fleur de lis, the heraldic device associated with the French royal coat of arms and which is frequently seen in pins and other jewelry designs, is thought to be a conventionalization of the white iris. However, its claim is not undisputed, the white lily being another contender for the honor.

Whether the iris was the inspiration or not, in any case the fleur de lis is a very ancient design which appears in Indian, Egyptian and Etruscan decoration. Some scholars think it has nothing to do with the iris or any other flower, being merely a design based on the shape of certain weapons, notably arrow or spear heads.

The iris flower with its large leafy petals curving upward and drooping gracefully outward and down is remarkably designed. It is a piece of ingenious botanical engineering, organized so that a honeysucking bee will pollinate any flower but the one from which it picked up the pollen.

The bee comes in for its landing on the broad inviting surface of the outer petal. As the bee, or other insect, crawls in to tap the nectar, it brushes the stigma which is conveniently set for this purpose. Thus any pollen from flowers previously visited will brush off on the stigma, resulting in pollination.

Continuing on its way to the honey, the bee brushes the anther, picking up more pollen. When it is ready to leave, the bee must back out the way it came, but this time it touches the non-receptive lower surface of the stigma. In this way the flower does not pollinate itself.

Science News Letter, May 1, 1954

VETERINARY MEDICINE

New Disease Threats

➤ TWO NEW possible threats to human health from cattle diseases have been discovered in California.

One of the cattle diseases is an influenza-like ailment that began last fall in southern California and slowly spread from herd to herd. From five to 50% of animals in different herds have been attacked. About two out of every 100 cases are fatal.

So far, there has been no evidence pointing to a recognized case in humans, but the disease broke out in animals in a dairy soon after the arrival of a worker from an infected area. This, however, may mean that the disease is spread by a mechanical carrier, for example, by the hands or clothing of a human, as foot and mouth disease sometimes is spread.

Sudden stopping of milk flow in affected cows makes the disease an economic worry to dairy farmers. A virus is suspected as cause of the disease, but so far no virus or other germ has been isolated. The disease is said to resemble Japanese bovine influenza.

Because of the possible threat to human health, Drs. L. S. Goerke and C. F. Pait of the Los Angeles City Department of Health have reported the situation to the Public Health Service in Washington, D. C.

The second new cattle disease that might affect humans is called sporadic bovine encephalomyelitis. The possibility of its attacking humans comes from finding, in human blood serum, complement fixing antibodies to the virus that causes the cattle disease.

This finding was made in routine blood testing of personnel and students by the Department of Public Health, School of Veterinary Medicine, University of California, Davis. It is reported by Drs. John B. Enright and Walter W. Sadler in the *Proceedings of the Society for Experimental Biology and Medicine* (March).

Science News Letter, May 1, 1954

MEDICINE

Test for Pre-Diabetics

➤ A SIX-MINUTE test that will tell which members of a diabetic's family are ultimately destined to get diabetes themselves has been announced by Dr. George E. Anderson of the State University of New York College of Medicine, New York.

The test is made by injecting a small dose, three units, of a special insulin into the veins. Blood sugar determinations are then made after two, four and six minutes. The results divide most diabetics into two distinctive categories. One group is made up of those sensitive, or responsive, to insulin. The other is made up of those insensitive to insulin.

The test thus becomes a good "yardstick" for measuring improvement in the diabetic patient and showing which ones need higher doses of insulin. Dr. Anderson states in *Science* (April 16) that this test is better for this purpose than "casual" blood sugar determinations.

When giving the test to 50 non-diabetic persons, he found that some very fat persons, although other tests did not show them to have diabetes, nevertheless were not responsive to the special insulin in the six-minute test.

This defective response to insulin, Dr. Anderson thinks, must result in a decreased insulin-efficiency and in increased production demand on the body for insulin. Since the obesity, or fatness, by itself imposes supernormal demands for insulin, such strained production-demand might be expected to result in "bankruptcy" of the body's insulin-producing mechanism.

The very fat person who develops diabetes usually suffers chiefly from a "relative" insufficiency of insulin, rather than from intrinsic inability of the body to produce insulin. This deficiency is relative to the exorbitant demands for insulin which the body cannot adequately meet.

Many diabetics give a history of having been very fat. But strikingly few non-diabetic very fat people actually develop diabetes, in spite of the increased demand for insulin made by their fatness. Which of the non-diabetic fat persons have a defective ability to respond to insulin might be told by the six-minute test before the diabetes develops, Dr. Anderson thinks.

The special insulin he uses is one free of a substance called the glucagon factor. An English scientist almost 20 years ago reported that diabetics could be classed as sensitive or insensitive to insulin. Canadian and U. S. workers were not able to confirm this. The reason, Dr. Anderson thinks, is that the commercial insulins in the United States and Canada were not free of this glucagon factor.

Science News Letter, May 1, 1954

GENERAL SCIENCE

"Red Baiting" Dismays

➤ THE THREAT against university professors by Congressional investigating committees is regarded in England "not only with dismay but with bewilderment," Dr. James Drever, professor of psychology at the University of Edinburgh, comments in the *Journal of Social Issues* (No. 3, 1953).

The vice-chancellors of British universities gathered last summer to discuss "the danger of interference by the state with properly academic affairs." However, they did not even consider questions involving members of their staffs or their political affiliations. That kind of threat seemed to them so very remote as not to merit consideration.

What they did consider was that, since English universities all receive more than half their incomes from the government, there might be some future attempt to influence policy or to guide research along certain lines. It was the view of those attending that this possibility was certainly not imminent, and probably would never arise.

In England, the dismissal of an individual college professor simply could not occur, Dr. Drever explained.

"A professor is appointed aut vitam aut culpam, which means in effect that so long as he performs his statutory duties and commits no serious crime he cannot be removed from office," Dr. Drever said. "There is no individual or committee, local or national, upon whose goodwill his job depends."

The secure relationship between government and university might not work in a larger country, Dr. Drever admitted.

"It depends ultimately upon the fact that the individuals concerned know and trust one another," he said.

Science News Letter, May 1, 1954

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Questions

ENGINEERING—How can a car's color affect safety? p. 284.

□ □ □

GENERAL SCIENCE—What groups are backing the National Science Fair? See p. 282.

Which city has grown the fastest in the 1940-1950 decade? p. 285.

□ □ □

GERONTOLOGY—How does cortisone affect those stricken by apoplexy? p. 283.

□ □ □

MEDICINE—How are green mice helping cancer studies? p. 276.

□ □ □

OCEANOGRAPHY—What is Greenland's largest export? p. 277.

□ □ □

PHYSICS—What new method could be used to check for possible ether drift? p. 277.

□ □ □

Photographs: Cover and pp. 278 and 279, Bell Telephone Laboratories; p. 275, Consolidated Vultee Aircraft Corp.; p. 282, Fremont Davis; p. 288, Windsor's.

TECHNOLOGY

Luxembourg Rebuilding Broadcasting Station

➤ RADIO BROADCASTING facilities in Luxembourg are being extended through construction of two 920-foot towers that will beam programs into Paris with a power of 500,000 watts.

Now being rebuilt by the Telefunken-Works of Hanover, Germany, the station presently operates at 250,000 watts. The two tall towers will be spaced about 1,000 feet apart to produce best performance, according to experiments on a scale model. The maximum power of any commercial U. S. station is 50,000 watts.

The finished station, which will handle live, network, recorded and taped broadcasts, will be the most modern in Europe.

Science News Letter, May 1, 1954

GOLF: Your LEFT SHOULDER makes the amazing difference!

One of the most startling discoveries to emerge from wide research in the golf swing is that your game literally **hinges on your left shoulder!**

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CARPET SHAMPOO, made by a British firm, has a built-in deterrent for moths and germs. Packaged in a tube, the shampoo mixes with enough hot water to clean 30 square yards of carpet.

Science News Letter, May 1, 1954

HOLDER FOR half-gallon bottles of mineral and distilled waters converts the jugs into easily handled pitchers. The butyrate plastic handle encircles the neck of a bottle and snaps flexibly over the bottom.

Science News Letter, May 1, 1954

REFLECTING TELESCOPE with a four-inch aluminized, paraboloid mirror has been developed for amateur astronomers who require inexpensive equipment. The mirror is protected with a quartz-like material containing zircon. Three eyepieces yield magnifications of 65 to 167 times. The telescope set includes an equatorial and alt-azimuth mount, a four-power viewfinder and tripod with hardwood folding legs. It comes ready to use.

Science News Letter, May 1, 1954

"RAIN BONNET" is a large swatch of plastic that can be draped over hair and hat to give protection from rains, as shown in the photograph. Tying under the chin, the

bonnet is permanently pleated so that it quickly folds into a neat, tiny package for carrying in a purse on sunny days.

Science News Letter, May 1, 1954

CAULKING COMPOUND is said to look and feel like white tile. Squeezed from a tube to fill cracks and crevices around sinks and tubs, the plastic rubber compound is designed to resist shrinking, crumbling or discoloration. It dries overnight.

Science News Letter, May 1, 1954

FISHING-ROD CASE is molded of a glass fiber reinforced plastic, like that being used in automobile bodies, and can withstand the shock of a 200-pound man jumping on it. Two inches in diameter, the rubber-capped case comes in lengths of 55, 46 and 39 inches, the longest of which weighs a pound. It will hold two fly rods or two or more casting rod tips and most spinning rods.

Science News Letter, May 1, 1954

ADJUSTABLE FEET for wobbly furniture are inserted like casters into the legs of desks, china cabinets and buffets. A screw arrangement permits the length to be adapted to dips in floors, or to compensate for carpets when the furniture rests partly on hardwood floors.

Science News Letter, May 1, 1954

HANDY LID converts ordinary Number 2 and Number 303 metal cans into containers for storing foods in refrigerators and freezing compartments. The reusable aluminum lid is pressed on after the can has been opened with a conventional kitchen can opener.

Science News Letter, May 1, 1954

Gadget Bulletin

AMERICA'S PREMIER LISTING OF NEW MACHINES AND GADGETS

The GADGET BULLETIN is a post card with names and addresses of manufacturers and inventors of the products described on this page every week.

Issued weekly to correspond with this Science News Letter column, each GADGET BULLETIN has a number to correspond with the number listed at the top of the column.

If you wish this Bulletin sent to you every week so that you can get information quickly on New Machines and Gadgets, send us $1.50 for a one year subscription (52 cards for quick reference and easy filing).

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5-1-4

Do You Know?

An automatic pilot which promises to increase the safety and ease of operation of light *airplanes* has been successfully flight-tested by the Civil Aeronautics Administration.

Increased demands for high *protein* livestock feeds have cut fertilizer use of cottonseed meal, fish scrap and meat scrap.

The National Bureau of Standards has designed a whirling flywheel that tests 18,000 newly minted *coins* an hour on the basis of vibrations.

Production from 3,500,000 of the nation's 5,500,000 farms is so small that the *farmer* derives little benefit from price supports.

The city of Milwaukee has signed a contract allowing a private company to produce *vitamin* B-12 concentrates from its processed sewage sludge.

A mixture of water and alcohol sprayed into *jet engines* of bombers increases the thrust at take-off.